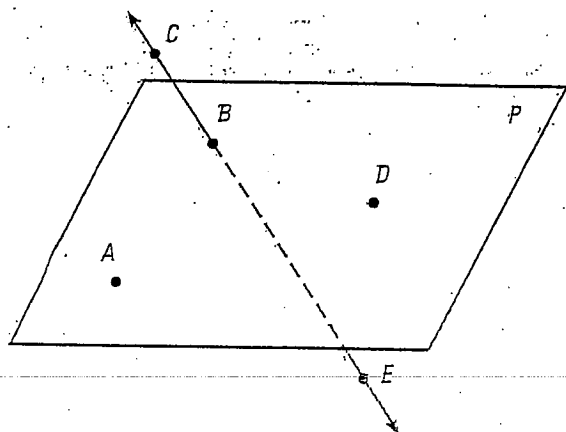


Use the diagram.

Name \_\_\_\_\_



1. Give another name for plane  $P$ .
2. What is the intersection of  $\overleftrightarrow{BC}$  with the plane  $P$ ?
3. Name a point not on line  $\overleftrightarrow{AB}$ .
4. What is the intersection of  $\overleftrightarrow{CE}$  with  $\overleftrightarrow{BC}$ ?

The endpoints of three line segments are  $A(1, 5)$ ,  $B(3, -1)$ , and  $C(7, 3)$ .

5. Find the midpoint of  $\overline{BC}$ .
6. Find the exact length of  $\overline{AC}$ .
7. Find the exact length of  $\overline{AB}$ .
8. Is  $\overline{AB} \cong \overline{AC}$ ?

#### 4. Use the Midpoint Formula

The midpoint of a line segment with endpoints  $(x_1, y_1)$  and  $(x_2, y_2)$  has coordinates  $\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$ .

##### PRACTICE

Find the midpoint of  $\overline{PQ}$  using the given coordinates.

19.  $P(2, 2)$  and  $Q(3, 3)$

20.  $P(-2, 0)$  and  $Q(5, -3)$

21.  $P(1.2, 8)$  and  $Q(3.5, -6.1)$

22.  $P\left(\frac{3}{5}, 2\right)$  and  $Q\left(-1, \frac{4}{3}\right)$

Find the coordinates of  $S$  if the midpoint of  $\overline{RS}$  is  $M$ .

23.  $R(-6, 4)$  and  $M\left(-\frac{3}{2}, 3\right)$

24.  $R(5, -1)$  and  $M\left(\frac{1}{2}, -\frac{9}{2}\right)$

#### 5. Use the Distance Formula

The distance between points  $A(x_1, y_1)$  and  $B(x_2, y_2)$  is given by the distance formula

$$AB = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

##### PRACTICE

Find the length of segment using the coordinates indicated. Round to the nearest tenth of a unit

25.  $P(2, 2)$  and  $Q(3, 3)$

26.  $P(-2, 0)$  and  $Q(5, -3)$

27.  $P(1.2, 8)$  and  $Q(3.5, -6.1)$

28.  $P\left(\frac{3}{5}, 2\right)$  and  $Q\left(-1, \frac{4}{3}\right)$

29.  $P(-4, 0)$  and  $Q(4, 0)$

30.  $P(-a, 2)$  and  $Q(a, 2)$

To remember the distance formula, think of the Pythagorean Theorem.